

**Studies on Arthropod Fauna of Alfalfa
Insect Feeding on *Hylemya* Flies (Diptera: Anthomyiidae)
Killed by a Phycomycosis¹**

A. G. WHEELER, JR.²

DEPARTMENT OF ENTOMOLOGY,
CORNELL UNIVERSITY, ITHACA, NEW YORK 14850

RECEIVED FOR PUBLICATION OCTOBER 6, 1971

Abstract: Observations were made at Ithaca, New York of insect feeding on the seedcorn maggot, *Hylemya platura*, and *H. florilega* (Diptera: Anthomyiidae) killed by a phycomycosis caused by *Entomophthora muscae*. Five species of normally plant-feeding Miridae and six species of predators of alfalfa insects were found to utilize cadavers as a source of food. The mirids *Plagiognathus politus* and *Lygus lineolaris* fed most commonly on the dead flies. It is suggested that the predaceous species generally do not recognize cadavers as a potential food source and that this food source might form a significant portion of the diet of *P. politus* and *L. lineolaris* during times of host plant deterioration.

INTRODUCTION

During a study of the arthropod fauna of alfalfa, observations were made in 1967 of insect feeding on *Hylemya* spp.³ (Diptera: Anthomyiidae) killed by a phycomycosis caused by *Entomophthora muscae* (Cohn). *E. muscae* is known to infect *Hylemya* spp. (Miller and McClanahan, 1959), and cadavers have been collected previously on alfalfa (Steinhaus and Marsh, 1962). Since there was no record of insect feeding on cadavers of *Hylemya* flies, observations were made from 1967 to 1969 at Cornell University's Savage Farm, Ithaca, New York, to identify the species feeding on flies and the frequency of this feeding behavior.

The seedcorn maggot, *H. platura*, and *H. florilega* appear to have similar habits (Miles, 1948) with both exhibiting a preference for feeding on sprouting seeds, particularly those of beans, peas, corn, and potatoes (Reid, 1940; Miles, 1948). Alfalfa may at times be attacked (Reid, 1940; Miller and McClanahan, 1960).

E. muscae is a well-known parasite on Diptera, especially large forms (Thaxter, 1888). Conidiophores of infected flies penetrate only the tergites, giving a striped appearance. Frequently the flies are found attached to inflorescences (Gustafsson, 1965). High humidity and cool temperatures have been suggested

¹ This research supported by grant GB-19239 from the National Science Foundation.

² Present address: Pennsylvania Department of Agriculture, Bureau of Plant Industry, Harrisburg, Pennsylvania 17120.

³ *Hylemya platura* (Meigen) (= *cilicrura* Rondani) and *H. florilega* (Zetterstedt) (= *liturata* Meigen = *trichodactyla* Rondani).

TABLE 1. Insects on alfalfa observed to feed on *Hylemya* flies killed by the fungus *Entomophthora muscae*.

Species	Stage	No. Observations
HEMIPTERA		
Miridae		
<i>Adelphocoris lineolatus</i> (Goeze)	Adult	2
	Nymph	1
<i>Lygus lineolaris</i> (Beauvois)	Adult	25
<i>Neurocolpus nubilis</i> (Say)	Adult	1
<i>Plagiognathus chrysanthemi</i> (Wolff)	Adult	2
<i>P. politus</i> Uhler	Adult	78
Nabidae		
<i>Nabis alternatus</i> Parshley	Adult	1
<i>N. americanoferus</i> Carayon	Adult	2
COLEOPTERA		
Staphylinidae		
<i>Philonthus</i> sp.	Adult	1
Cantharidae		
<i>Cantharis carolinus</i> Fabricius	Adult	1
Coccinellidae		
<i>Coleomegilla maculata</i> (De Geer)	Adult	3
	Larva	1
<i>Hippodamia convergens</i> (Guerin)	Adult	1

as favoring the incidence of disease (Miller and McClanahan, 1959; Gustafsson, 1965).

RESULTS AND DISCUSSION

In June, 1967, large numbers of *Hylemya* spp. infected with *E. muscae* were found clinging to terminal stems of alfalfa. During June, adults of the mirid *Plagiognathus politus* Uhler were observed with proboscises inserted in dead *Hylemya* flies, frequently in the eyes of the flies. A 30 minute search in alfalfa on 11 July 1967, revealed more than 40 instances of feeding on cadavers by *P. politus*.

In addition to *P. politus* several other common phytophagous mirids on alfalfa, as well as several important predators of alfalfa insects, were found to utilize dead flies as a source of food. Table 1 lists the species found to feed on *Hylemya* flies and the number of times feeding was observed.

It is impossible to assess the amount of energy derived from feeding on dead flies. For the mirids *Adelphocoris lineolatus* (Goeze) and *P. chrysanthemi* (Wolff) the amount must be small, but perhaps could be significant when the alfalfa is of poor quality because of disease, insect damage, or physiological change in the host plant. The energy obtained from feeding on cadavers by the predaceous species appears also to be small. Predators such as coccinellids and nabids typically attack moving prey. Perhaps the cadavers were not generally recognized as a potential food source. These predators were found to be infrequent feeders on

another stationary food source on alfalfa, mummified pea aphids containing the late stages of aphidiine parasites (Wheeler et al., 1968). With *P. politus* and *Lygus lineolaris* (Beauvois) the habit of feeding on cadavers of *Hylemya* spp. appears to be well developed. These normally plant-feeding mirids were also the most common predators on mummified pea aphids (Wheeler et al., 1968). In times of host plant deterioration this food source might form a significant portion of the diet of *P. politus* and *L. lineolaris*.

Literature Cited

- GUSTAFSSON, M. 1965. On species of the genus *Entomophthora* Fres. in Sweden. I. Classification and distribution. LantbrHögsk. Annlr. **31**: 103-212.
- MILES, M. 1948. Field observations on the bean seed fly (corn seed maggot), *Chortophila cilicrura*, Rond, and *C. trichodactyla*, Rond. Bull. ent. Res. **38**: 559-74.
- MILLER, L. A. AND R. J. MCCLANAHAN. 1959. Note on occurrence of the fungus *Empusa muscae* Cohn on adults of the onion maggot, *Hylemya antiqua* (Meig.) (Diptera: Anthomyiidae). Can. Ent. **91**: 525-26.
- AND ———. 1960. Life-History of the seed corn maggot, *Hylemya cilicrura* (Rond.) and of *H. liturata* (Mg.) (Diptera: Anthomyiidae) in southwestern Ontario. Can. Ent. **92**: 210-21.
- REID, W. J., JR. 1940. Biology of the seed corn maggot in the coastal plain of the South Atlantic States. USDA Tech. Bull. 723, 43pp.
- STEINHAUS, E. A. AND G. A. MARSH. 1962. Report of diagnoses of diseased insects 1951-1961. Hilgardia **33**: 349-490.
- THAXTER, R. 1888. The Entomophthoreae of the United States. Mem. Bost. Soc. Nat. Hist. **4**: 133-210.
- WHEELER, A. G., JR., J. T. HAYES, AND J. L. STEPHENS. 1968. Insects predators of mummified pea aphids. Can. Ent. **100**: 221-22.